

REMARKS

Claims 1 and 4-7 have been examined pursuant to a previous election. Claims 2 and 19 were previously cancelled, and claims 3, 8-18, and 20-29 have been withdrawn. Favorable reconsideration of the application is respectfully requested.

Objections to the Drawings

The Examiner objects to Figs. 35-36 in that both figures should be labeled "Prior Art" or comparable. Pursuant to the Examiner's comments, a replacement drawing sheet for Figs. 35 and 36 is provided, wherein both figures are labeled "Conventional Art". Accordingly, Applicants respectfully request that the objections be withdrawn.

Claim Rejections -- 35 U.S.C. § 102(b)

Aspects of the invention include a substrate cutting system for cutting a bonded brittle material substrate composite having a first substrate and a second substrate. A cutting apparatus includes a first cutting device located on the first substrate and a second cutting device located on the second substrate. Each cutting device includes a scribing portion for forming a scribing line on each respective substrate, a breaking portion for breaking each respective substrate along the scribing line, and a backup portion for applying pressure to the substrate opposite a respective breaking portion.

The apparatus of the present invention may simultaneously cut two brittle material substrates making up a bonded brittle material substrate. A scribing mechanism and backup mechanism are provided so as to be movable closer to/away from the substrate, and they are provided so as to apply a predetermined force on the substrate. With such a structure, when both sides of the bonded brittle material substrate are simultaneously processed, the scribing

mechanism and the backup mechanism move along the surface of the substrate, which results in an advantage of not applying unnecessary force on the substrate.

The Examiner rejects claims 1 and 4-7 pursuant to 35 U.S.C. § 102(b) as being anticipated by Neamtu, U.S. Patent No. 5,609,075 (Neamtu). Neamtu discloses an apparatus and method for manufacturing razor blades from a strip of metal material "S", which the Examiner equates to a "substrate". To improve efficiency, the original strip S is cut into six strips (A-F) from which the individual razor blades are made. In a first stage, the initial strip metal S is cut into two strips referred to as S1 and S2 (or A-C and D-F), and cutting lines are formed for the individual strips. (See, e.g., Neamtu at col. 5, lines 10-27; Figs. 7 and 8.) In a second stage, the two strips S1 and S2 are cut into individual strips A, B, C, D, E, and F. (See, e.g., Neamtu at col. 6, lines 18-20 and 61-66; Figs. 9 and 10.)

I. Neamtu Cannot Be Applied To Brittle Substrates

The claimed invention provides for the dividing of a brittle material substrate by scribing and breaking the substrate with the application of pressure. In contrast, the device of Neamtu is for slitting metal, and therefore does not possess a scribing portion or breaking portion that apply pressure to break a substrate. In Neamtu, the slitting knives 40 and 41 apply shearing forces on a metal plate to deform it to cut the individual strips (A-F), thereby obtaining a slit or partial slit of the metal material. (See Neamtu at Figs. 6-8.) If such an operation were applied to a brittle material, as in the claimed invention, the cutting plane would be torn and the brittle substrate would not be properly broken. The device of Neamtu, therefore, is not comparable to the claimed invention insofar as the device of Neamtu would not work to break a brittle material properly. To clarify this distinction, the claims have been amended to recite that the substrate is a "brittle material" substrate.

II. Neamtu Does Not Disclose Scribing/Backup Portion Pairs

In addition, in the claimed invention, when the substrate is scribed, the scribing means 412 of the first cutting device and the backup portion 414 of the second cutting device are positioned so as to face each other. In addition, the scribing means 412 of the second cutting device and the backup portion 414 of the first cutting device similarly are positioned so as to face each other. (See, e.g., Application at Fig. 7). This structure enables each respective scribing means 412 to apply pressure on the first and second substrates, so as to form a scribe line on the first substrate and a scribe line on the second substrate. The device of Neamtu lacks these features. In the Neamtu device, neither the guide rollers 26 and 27, nor the pinch rollers 56 and 57, are positioned to face the slitting knives 40 and 41. (See, e.g., Neamtu at Figs. 4 and 10.) Claim 1 has been amended to clarify that the scribing means apply pressure to the substrate, and the backup portions each face a respective scribing means.

III. Neamtu Does Not Disclose First and Second Backup Portions

The Examiner asserts that the claimed first and second backup portions correspond to guide rollers 26 and 27 of the Neamtu device, as seen, for example, in Fig. 4. In particular, the Examiner states that elements 26 and 27 constitute back up portions "for supporting" the substrate during scribing. At the outset, it appears that the Examiner has not applied the current version of claim 1, insofar as the phrase "for supporting" was deleted in response to the previous Office Action in favor of the phrase "which moves to apply pressure against" the substrate. Elements 26 and 27 are described as "guide rollers" which guide the original metal strip S. They do not back up the purported scribing blades 40, 41 at all. (See Neamtu at col. 4, lines 43-45; Fig. 4.) In addition, there is no description that elements 26 and 27 move to apply pressure against the substrate, as recited in the current version of the claims.

IV. Neamtu Does Not Disclose First and Second Breaking Portions

In addition, the Examiner asserts that the claimed first and second breaking portions correspond to pinch rollers 56 and 57 of the Neamtu device. In particular, the Examiner states that elements 56 and 57 are breaking portions "for cutting" the substrate along the scribe line. Again, the Examiner appears to apply the previous version of the claims, and not the amendment in response to the previous Office Action that the breaking portions are for "breaking" (not for "cutting") the substrates "by applying pressure against" the substrates. Furthermore, pinch rollers 56 and 57 merely guide the intermediate strips S1 and S2 into the second stage in which the individual strips (A-F) are cut. (See Neamtu at col. 6, lines 19-28; Fig. 10.) The pinch rollers 56 and 57, therefore, neither cut nor break the intermediate metal strips S1 or S2.

In the device of Neamtu, the individual strips (A-F) are actually cut from the intermediate strips S1 and S2 by rotatable members 76 and 77. In particular, a V-shaped edge of element 76 mates with a groove in element 77 to cut the individual strips. Even these elements, therefore, differ from the claimed breaking portions, which "break" the substrate by "applying pressure against" the substrate along the scribe line.

For at least these reasons, claims 1 and 4-7 are not anticipated by Neamtu, and therefore the rejection of these claims should be withdrawn. The amendments contained herein are mere clarifications, and Applicants, therefore, submit that the amendments should be entered even though they are in response to a Final Office Action.

Conclusion

Claims 1 and 4-7 are believed to be allowable and the application is believed to be in condition for allowance. A prompt action to such end is earnestly solicited.

Should the Examiner feel that a telephone interview would be helpful to facilitate favorable prosecution of the above-identified application, the Examiner is invited to contact the undersigned at the telephone number provided below.

Respectfully submitted,

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